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## Landscape Architecture and Water

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### Abstract

The study of the hydraulic buildings and the exemplary case of several urban systems, whose growth was supported by the hydraulic frame, intended to understand and clarify the importance of water on the Canarias landscape. Mills, wells, ditches, ponds and reservoirs directly shaped the landscape, constituting themselves visible lines and indirectly, by conditioning the provision of agricultural land and some settlements. In relation to the urban conditions, the architectural of water, leads the formal quality. It has really importance to the identity of the place, capable for norm, roles and policy and standard for the construction of the territory and the city.

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### 1. Water and territory

There is an almost infinite network of canals that traverse the western islands in all directions, taking and leaving water in different places, sometimes many miles apart from each other. The flow running through each, separately, is small and discontinuous. Most of the water today is being taken from wells or galleries. It rarely comes directly from sources and even more rarely, natural waterways. They are already a consideration on the landscape. Being small and open ditches adapt as much as possible to the contours of ravines and mountains. Only when it becomes absolutely necessary will jump to the other side of the ravine. In these cases aqueducts appear. Also close, but often tall, demonstrating a disproportionate effort to the flow work they carry. It is difficult to understand these long runs today-without considering the need to carry water from areas of mediocrities, sometimes from the centre of the islands, to the last farm coast. Any of the main lines we'll be adding the contributions of other ditches when hydraulic height permits. And this, in turn, will lead first to irrigate larger areas or municipalities and, after successive Corners come to die in small ditches that formed in the interior of a building, until recently, the last step

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water furrow ground at the foot of the plant. The division of the Roman territory was limited by the capacity of the farmer, and therefore the latter is a uniform element that made possible the homogenous centuriation over hundreds of kilometres.

In the case of islands, the size of farms (less in the sense of ownership in the morphological) was conditional on the possibilities of water in each area. It is interesting to note here how since the years of the conquest the division of the lands on both banks of the channels of the gullies was proceeded (even then with water), distributing them only one of its margins as irrigated land leaving the other without water, so that the surplus would go to the strip of coast where crops were profitable for allowing the production of tropical plants for export climate in these areas. This network, despite the strength of implementation it has on the landscape is not the only hydraulic element of importance. Because of the irregularity of the channels, the special division glands of water and its ownership structure ponds and dams appear. Ponds, by number, dot the route of the canals, its variable forms depending on the materials used in each period are occupying the upper surfaces of the farms, usually as their own buildings for agricultural use and in many areas beating these number. This is also a feature: the form of settlement of the building in relation to the particular topography of each farm.

In the plot, we have created formed by the lines of flow of water, corners and ponds that as a succession of objects define the landscape, we must add the buildings that house the hydraulic machines, whether they use water as driving force, or which, conversely, increase the water extract or by an auxiliary force. Among them were taken two examples: a mill and a ferris wheel. Both should be seen not only from its architectural interest as an isolated building itself important, but above all as part and principle of a network that runs through the surrounding territory and thus constitutes a new characteristic and capable of inducing element in the designing process of landscape that surrounds them.

Let's talk then of the two hydraulic parts. After the fire was probably the waterwheel the second greatest invention of mankind. The first he facilitated the transformation of matter; the second, freed from physical labour. Waterwheel, already described in the first treated (eg Vitruvio) advantage from a flow rate to produce a rotational movement as usable energy, either to elevate water or to move any machine mechanisms. Most of the wheels shown in old treated operated by a direct current pressure exerted on the submerged part of the wheel. However, the case of islands as already said, is not an example of the possibility of implementing these vertical wheels. The little volume and its timing were necessary that the system used was that of the horizontal wheel - intercessor that leverages the blow of a small flow of water pressure on the turbine-blades. This system used in the islands appears explained and drawn into a treaty of Pseudo Juanelo Turriano probably the first devoted exclusively to the hydraulic, time of Philip II (

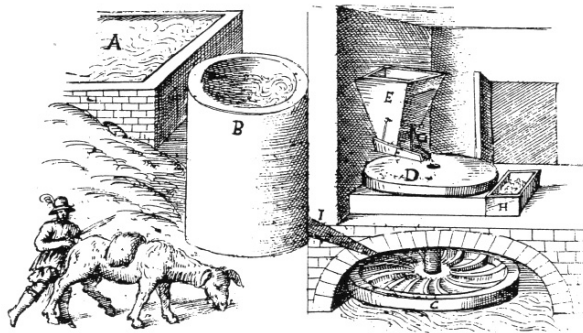


Figure 1).

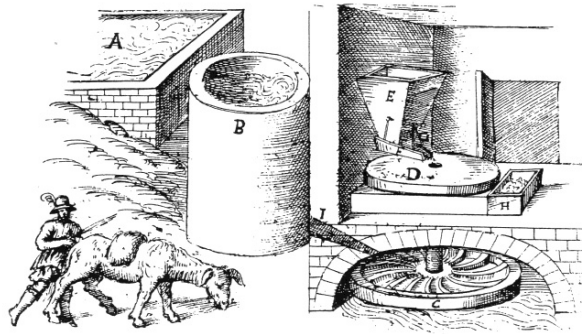


Figure 1 Description of the operation of the horizontal mill. Pseudo Juanelo Turriano.

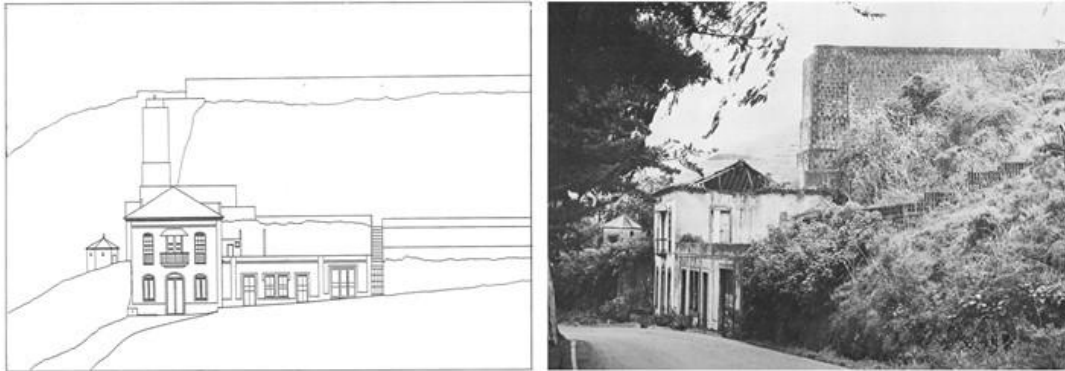


Figure 2 Mill Barber

It has done this description of the workings of the wheel to explain then why the morphology of the water mills. Most characteristic, which usually makes recognizable, it is the hub. Being a water reservoir for pressure on the wheel, its height is itself central and genuine obelisks on the landscape. Depending on the topography will be more or less visible and your mouth will ditch suspended on stilts as aqueduct or on a wall that connects to the hub. At the bottom of this column (the cube) the building housing the warehouse and machinery will be located, and lower, usually in the basement, in a dark, damp and unhealthy place (perhaps because of this popular tradition has related where dwells the devil) waterwheel is located. Hub height is determined by the available bandwidth and the necessary water pressure on the wheel. Being actually from a tower built to hold water at high pressure, often to be built in stages, so that the masonry section will gradually increase until it reaches the base. The weight of the bucket and the water in it does it will not fall on the house but usually behind, reinforcing the whole picture in your normal vision from the door of the mill, from below.

These functional characteristics explain how the water mill works. As usual, the building on the land or on the landscape cause an isolated event and each of the functions can morphologically be developed independently. This makes them not compact buildings, ordered from one law, but individual pieces that are rotated and added that adapt to each local situation. The Mill Barber (c.1905, Figure 2), between the towns of Sta. Brigida and Matthew in Gran Canaria had, as usual, right on the water flow, not its direct use. It is a link in the chain of parts constituting the water path.

The wheel shall, however, the first part of this sequence of elements in the landscape (Figure 3). Its construction (undated) may be mid-nineteenth century and is by no means a common element in the islands. In addition to its value as extremely sophisticated and perfect machine is a beautiful piece of architecture as seen in the uprising. Therein, due to the difference in hydraulic elevation and enters the basal extracted, consists of a succession of platforms, stairs and vertical axes without correlation. A truly Piranesian space. Your site plan shows deliberately your current environment. The wheel was previously attached to the side of the ravine and surrounded by palm trees. Both elements

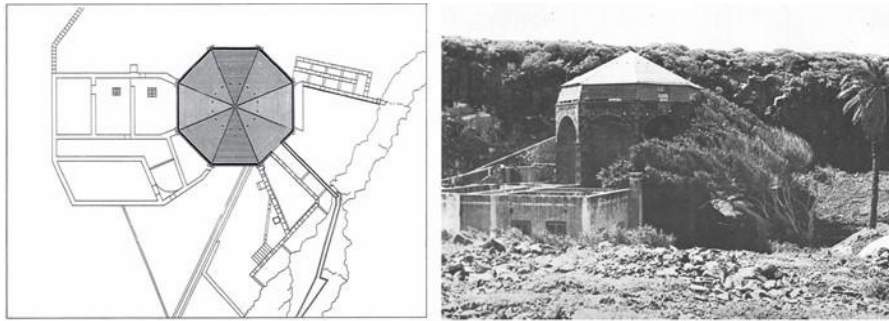


Figure 3 Noria de Jinamar

Individually, like many of the island's landscape, have their undoubted architectural value. However, more important still possess as part of an assembly of the whole series of elements that were still available solely by the law of gravity in the watercourse. Thus, machines, ditches, ponds and reservoirs progressively configured in advance kilometre, most of landscape, directly, while in they constitute lines visible, indirectly, by conditioning the provision of crops, terracing, in the agricultural field and the willingness of some settlements and cities of the archipelago.

## 2. The urban

In this relationship with the city, we tried to explain succinctly expressions that reflect his notoriety important and innovative aspects to consider. Perhaps certainly readable only by disconnected and partials elements, almost moments in the set, are able to evoke, through an analogue process, the historical memory of what was and what was above, rather than allowing reading, understanding and not least the fruition of the reinterpretation of an urban system.

This alleged rift of time allows us a more appropriate limits of Article own measure, needing to do a presentation as justification. In the development of the discipline, Bloch (1930) wrote in the introduction to his "les caracteres originaux of l'histoire Cottage française", that there are times in which a synthesis, and even a priori appearance can give greater service that developed by many analyses, where there are moments in which matter especially articulate well the problems, rather than trying to solve them. The rural history in our country seems to be in one of these moments. What I intend to do, is the view of the horizon, the browser is granted previously to venture into the dense forest, which will not allow broader views.

But while our mind is this, we must be aware that horizon and manifest a hypothesis, in which the type of development based on the infinite land consumption and dispersal of interventions, behaves as in the case of Villa de La Orotava, Güimar, Garachico, Canary Icod and many other cities, a radical dissolution of the early settlement. The media rules the divisions and ownership structure pose real regulatory elements of the processes of construction, while the current planning instruments clearly show the inability to have conjoined the overall goals of the transformation to the physical characteristics of the transformation itself. This seemingly obvious finding answers to the general problem of defining aspects (rules) that precede the process of building the city, and in particular the fact that they occur on one side, based on total abstraction from to specific situations; and other, based on elements of all fragmented and partial, rarely recognizable in a unitary logic. Thus, studying La Orotava (as an exemplary case) and trying to make the extensible study assumed for the Canary cities, having similar considerations as Güimar, Icod, Garachico, seek precisely unravel the qualification of urban system, trying to prioritize and give all your content in front of a dull reality and reflection focusing primarily on the ability to identify the rules, the functional principles of the settlement system in its relationship with the so-called Water Architecture. To do reflect on the formation of the territory, looking at the artificiality of "watercourse" and in its layout, the royal settlement, and secondly using typological description to enable the individualization of diverse building types strongly respect the system of urban-geographic relationships. There, where the morphological deformation of the joint spoke on the simple definition of building types intend to define and identify sites of

particular complexity and fascination.

In this town of La Orotava, which has always been the subject of numerous descriptions, largely for its landscape quality described in the texts, (Nichols, 1583 and Espinosa, 1594) as inseparable category in the historical transformation, to the studies of the urban as an interpretation of the architectural object and its layout (Figure 4). The layout of the drive follows the north-south direction, intersecting to the west with the Villa de La Orotava qualifying certain points, places on the streets Brown (now Doctor Domingo González), San Juan, San Francisco, School, Cologan, Innocence Garcia and Thomas Zero and some alleys. Taking advantage of the large difference in level at the ends of driving, are staggered ten falls, that acting on rodeznos give strength to flour mills, of which six are located to the right of Chestnut Street; one on the street San Juan, one in San Francisco and the last two on the left or west of College Street. These mills, as already mentioned, are configured for a bucket of masonry dam water and a pair of horizontal hydraulic wheels (rodeznos) to move the wheels or rotating millstones.

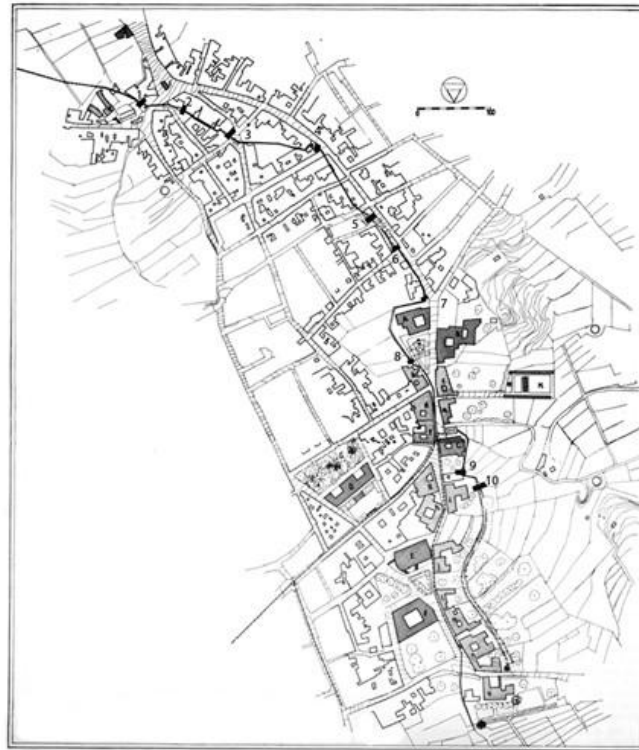


Figure 4 Villa de la Orotava. Location Map of the Mills

These minimum parts that are introduced into the semiagrícola-urban fabric, and that over time give patterns of urbanization level layout of streets, volumes, alignments and boundaries behave as urban pieces which offer the facade and front street, square ... and qualitative determinant of urban space that comprise linked to urban void inside apples, orchards, gardens. etc. The water inlet to the hubs and connection of the different parts is effected by means of channels tea, high in most cases, they lose much of the water (cracks) so there Anti-Ditch, discovered and defined by pavers for channeling water.

Thus, as this complex architectural type in functionality provided by this other side to be able to build the city and provide an urban system based on driving itself where are settling different urban parts of a public nature Hospital of the Holy Trinity Cemetery former Jesuit College, Church of the Conception Convent of San Francisco, Convento de Santa Catalina, and the manors of Benítez de Lugo, Malina, Frenchy-Cologan, Machado, Valcárcel, Monteverde, Lercaro-Justiniani, Xuárez Guard ... this urban system is presented as an interaction of constant elements in which the validity of architectural type at its finest and the layout of driving stand as regal as an essential feature of this place.



This hypothesis can see represented in the drawings 1: 5000, not only of the town of La Orotava, but in the cities of Guimar, Icod and Garachico; where the considerations set out previously take the rank of invariants.

In the document the architect Tomás Machado Méndez published, in August 1941, you can see how this system will enable not only the settlement of the above architectural types, but the benchmarks for plotting extending the Villa to the south, and in the downtown area of the hull in your area to the west, proving this hypothesis that there is a correspondence between qualification Village area and formal response from the settlement of the mills in different sectors and parts.

Therefore we distinguish three zones regarding this feature:

- A) The Edge of the Villa and its relation to the Territory.
- B) The Urban Element.
- C) The qualification Urban Central Area.

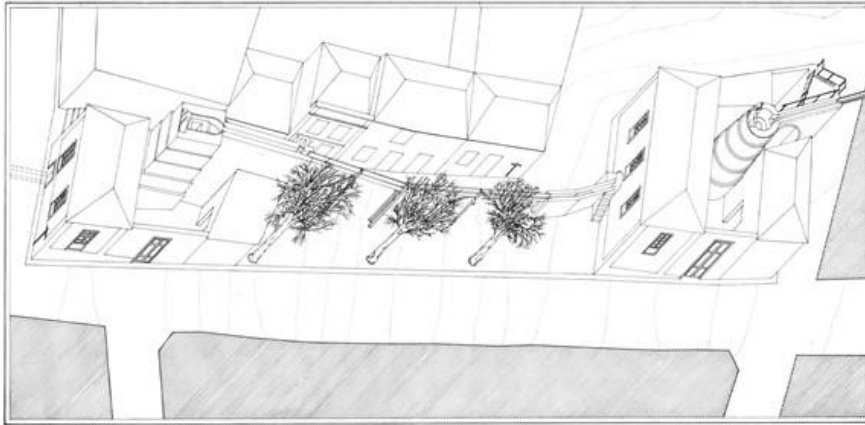


Figure 5 Mills 5 and 6 in the village of La Orotava

A) The Edge Villa, in its relation to agricultural land, shows that role transition, so the mill appears in a dispersed situation, as one element, but with intent to reorganize parts changing as Plaza and Church of Mercy, Lion Street, Cape High street; where, precisely, the mills are presented as pieces of mediation between urban silting and internal garden city. It is precisely the need to offer an urban place when the mill gives formal qualifications and response of focus path, as in the case of the mill between Calle San Juan and Calle Rosa de Lara, controlled from the path mentioned and highlighted by the architect Tomás Méndez Machado when specifically mentioned:

The layout matches the current to the mill No. 3 (the aforementioned), for face difficulties at the entrance to the mills 2 and 3, to follow the trace Street San Juan. From the mill 3, the trace follows the street Rosa Lara, lowering Chestnut Street.

B) The Urban Element, or how these objects are capable, lack of urban qualification, to establish itself as protagonists of an urban space. This happens in all the two mills 5 and 6 in the streets Domingo González García (Figure 5), Calvo Sotelo, New Street; where not only are presented as directors of the road layout of this sector of town, but qualify an urban-plaza space, and the comfort each other in their quiet environment and educated manifest the beauty of a moment in the city, with references literary and pictorial fill it with memories, as shown in Table Lopez Ruiz, at the beginning of the century, which not only shows the attractiveness of the place, but leaves us one of the only documents graphics, where you can check the construction of the Tea channelling between the Mills.

C) The qualification of the central urban area, where it is one of the functional concentrations and most significant in the Villa urban types. It stretches from Plaza San Francisco Street San Francisco, Street College Street Cologan, and in which the Hospital of the Holy Trinity, Church of San Francisco, Iglesia de la Concepción, Post Office Emergency Hospital are located, National Insurance Institute, Cemetery and important manors many of them converted to house museum, exhibitions, etc. It is this accumulation and inheritance of functional and morphological elements which enables the Silence and the adequacy of the layout and types this part of town.

So we can see that from the mill 7 located at street Domingo González until located in the San Francisco Square in front of the Hospital, a change of tracing of the status of the former convent, now site of San Francisco will

originate, according Melchor plane Zárate, which tells us how, somehow, in this central area the path to the existing, opposite to the above areas in which qualified them with engendered and the site made suits. But note that regardless of the adequacy and concerning the delimitation of urban interest rates in the industry, you can see how morphologically there is also a distinction, though not structural, yes qualitative, since the mill appears insert as if one more body were, to a unitary morphological whole, not as individual part, which becomes the protagonist, but as a point that supports a hierarchy and allowing its urban function in urban space.

The urban function demonstrates its nature, its volumetric force, not in its relation to the usual mill house, but like a sculpture, a monolith, which reminds us of the historical stratification of the place itself, concerned. Then silence water, channelled underground, giving a voice to the city with its buildings, to emanate again, laundries with its urban function, located in San Francisco and in turn enable definitely shows its double mission: one object of the territory in the two rear mills, to the west of College street, and another, its strictly urban supply response by College street, Church of the Conception (Source) Cologan street, finally, as suppose, in the urban garden Orotava territory with its ditches, ponds, gardens, flowers.

The seriality of the elements, the interaction obtained through minimum amount of interventions, but typologically defined, is the result of being a historical constant in the transformation of urban scale sector, and its overlap with the conduction system, the basis is given for building the city. Repeating the minimal elements linked to the structure of the overall network, (tracing and construction), with which it defines part of the natural artificial, is a tradition of the place, and we understand that with the plurality of interventions architecture you can raise a normative category, a principle of rule, which is not inconsistent with the significant value of the site, and can not necessarily be faced with the interests of a community expressed today with pieces of small importance, in a urban sprawl, control of which cannot be solved with mere standardized instruments. Thus we understand that the islands have a multitude of benchmarks able to provide and control the various processes of urbanization; where perhaps, the architecture of the water, present an undeniable identity of the place and to which little attention has been given to establish itself as one of the key pieces to give guidelines and standards for the construction of the territory and the city.

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